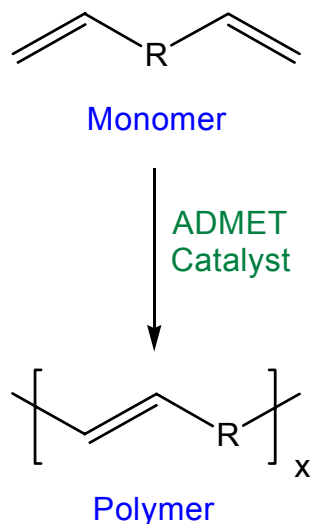


Tailored Polymer Structures via Metathesis Polycondensation Chemistry

K. B. Wagener, University of Florida – Gainesville

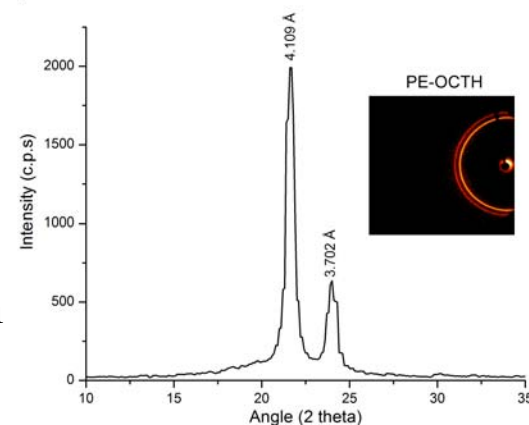
NSF – Division of Materials Research (DMR) Grant Award # 0314110



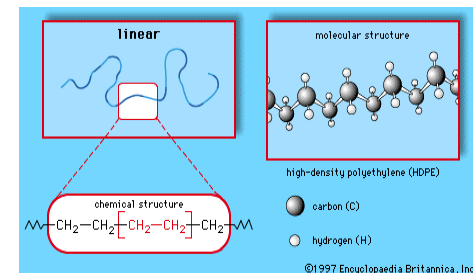
The ADMET reaction, discovered at the University of Florida several years ago, is an example of polycondensation chemistry, a class of reactions that are used to prepare consumer plastics such as polyester (for beverage bottles) and nylon (for carpet). ADMET polymerization allows us to model the largest volume plastic produced in the world, which is

polyethylene, through the synthesis of precise polyolefin structures.

Analysis of these ‘perfect’ polymers permits the delineation of fundamental structure-property relationships widely sought after in industry. This strategy also is being used by us to investigate other industrial copolymers such as acrylics and vinyl ethers. In addition, we have developed a newly patented class of potentially bio-active amino acid polymers, known as bio-olefins.



X-ray picture of ADMET model copolymer



Polyethylene

Well Controlled Polymer Structures Via Metathesis Chemistry

K. B. Wagener, University of Florida – Gainesville

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Accomplishments – Past 12 Months (through August 2004)

The Wagener research group is comprised of 10 graduate students and 2 undergraduates, who during the past 12 months produced 10 NSF sponsored, refereed publications and 6 U.S. patents. Three PhD degrees, 1 Masters degree and 2 BS degrees have been conferred during this period.

20 Invited lectures have been made in Japan, Korea and the USA. Wagener group members also participated in various national scientific conferences this year.

This research is being performed with the cooperation of collaborators from around the globe: Kimura, Fujii, and Masuda at Kyoto University (Japan), Professor Seki at Nagoya University (Japan), Chaffin and Bates at the University of Minnesota, Wunderlich at the University of Tennessee, Mathot at DSM (the Netherlands), and Alamo at Florida State University.

Further, interactions with Dr. Lisa Baugh at ExxonMobil, and with Materia, Inc, a Caltech startup company, have enabled us to leverage NSF support.



The Wagener Research Group